United Nations

FCCC/ARR/2017/SVK

Framework Convention on Climate Change

Distr.: General
14 March 2018

English only

Report on the individual review of the annual submission of Slovakia submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of Slovakia, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 18 to 23 September 2017 in Bonn, Germany.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

GE.18-03955 (E)

1803955

Please recycle

Contents

		Paragraphs	*Page*
	Abbreviations and acronyms		3
I.	Introduction	1–5	5
II.	Summary and general assessment of the 2017 annual submission	6	6
III.	Status of implementation of issues and/or problems raised in the previous review report	7	8
IV.	Issues identified in three successive reviews and not addressed by the Party	8	16
V.	Additional findings made during the 2017 individual inventory review	9	17
VI.	Application of adjustments	10	39
VII.	Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol	11	39
VIII.	Questions of implementation	12	39
Annexes			
I.	Overview of greenhouse gas emissions and removals for Slovakia for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Slovakia		40
II.	Information to be included in the compilation and accounting database		44
III.	Additional information to support findings in table 2		46
IV.	Documents and information used during the review		47

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
AR	afforestation and reforestation
Annex A sources	source categories included in Annex A to the Kyoto Protocol
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
BCEF	biomass conversion and expansion factor
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
CSC	carbon stock change
dm	dry matter
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
EUROCONTROL	European Organisation for the Safety of Air Navigation
FM	forest management
FMRL	forest management reference level
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HFC-134a	trifluoroethane
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LPG	liquefied petroleum gas
LULUCF	land use, land-use change and forestry
MSW	municipal solid waste
N	nitrogen
NA	not applicable
NCV	net calorific value
NE	not estimated
Nex	nitrogen excretion
NFI	national forest inventory
NF_3	nitrogen trifluoride

NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
NOx	nitrogen oxides
N_2O	nitrous oxide
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
VS	volatile solids
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of Slovakia organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 18 to 23 September 2017 in Bonn, Germany, and was coordinated by Ms. Veronica Colerio, Mr. Roman Payo and Mr. Davor Vesligaj (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Slovakia.

Table 1
Composition of the expert review team that conducted the review of Slovakia

Area of expertise	*Name*	*Party*
Generalist	Ms. Elena Gavrilova	The former Yugoslav Republic of Macedonia
	Ms. Kristina Saarinen	Finland
Energy	Ms. Veronika Ginzburg	Russian Federation
	Mr. Giorgi Mukhigulishvili	Georgia
	Mr. Dingane Sithole	Zimbabwe
	Mr. Hongwei Yang	China
IPPU	Ms. Emma Salisbury	United Kingdom of Great Britain and Northern Ireland
	Mr. Koen Smekens	Belgium
	Mr. David Glen Thistlethwaite	United Kingdom
Agriculture	Ms. Laura Cardenas	United Kingdom
	Ms. Yue Li	China
	Mr. Asaye Ketema Sekie	Ethiopia
LULUCF	Mr. Craig William Elvidge	New Zealand
	Mr. Agustín José Inthamoussu	Uruguay
	Ms. Thelma Krug	Brazil
	Mr. Harry Vreuls	Netherlands
Waste	Mr. Cristobal Felix Diaz Morejon	Cuba
	Mr. Pavel Gavrilita	Republic of Moldova
	Mr. Igor Ristovski	The former Yugoslav Republic of Macedonia
Lead reviewers	Ms. Saarinen	
	Ms. Gavrilova	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has

[1] At the time of publication of this report, Slovakia had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

made recommendations that Slovakia resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings and, if applicable, the encouragements of the ERT to Slovakia to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Slovakia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual GHG emissions for Slovakia, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Slovakia.

5. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the 2017 annual submission

6. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2
Summary of review results and general assessment of the inventory of Slovakia

Assessment			*Issue or problem ID #(s) in table 3 and or 5[a]*
Date of submission	Original submission: 11 April 2017 (NIR), 11 April 2017, Version 3 (CRF tables), 11 April 2017 (SEF-CP1-2016 and SEF-CP2-2016)		
Review format	Centralized		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	E.20, E.36, A.8
	(c) Development and selection of EFs	Yes	L.1, L.7, L.9, L.11, KL.5, KL.8
	(d) Collection and selection of AD	Yes	E.24, I.4, I.12, L.1, L.7
	(e) Reporting of recalculations	Yes	W.5
	(f) Reporting of a consistent time series	Yes	E.32
	(g) Reporting of uncertainties, including methodologies	Yes	I.8, L.10
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	G.6, A.9, A.10, A.12, L.12, W.6
	(j) Application of corrections to the inventory	No	

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.
[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Assessment			*Issue or problem ID [a] in table 3 and or 5[b]*
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	No	G.6, A.12
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	E.26, E.27, E.28, E.29, E.30, E.31, E.34, E.37, I.7
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	No	
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the standard independent assessment report?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	No	
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.6
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.1, KL.9
	(c) Reporting requirements of decision 6/CMP.9	Yes	KL.10
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	

Assessment			*Issue or problem ID(s) in table 3 and/or 5*[a]
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	The Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors that are not listed in this table but are included in table 3 and/or 5.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 3 March 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Slovakia

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Article 3, paragraph 14, of the Kyoto Protocol (G.7, 2016) (G.7, 2015) Transparency	Include in the NIR information on any changes in the information provided in accordance with Article 3, paragraph 14, of the Kyoto Protocol.	Resolved. The Party reported in the NIR (chapter 15, p.409) that it did not have updated information nor were there any changes to the information reported in chapter 15 of the 2016 NIR.
G.2	Inventory planning (G.3, 2016) (G.3, 2015) (table 4, 2014) Transparency	Include in the NIR the relevant information for the planning and prioritization of the improvements for the next annual submission.	Resolved. The Party reported relevant information on the planning and prioritization of the improvements for the next annual submission (NIR, chapter 1.2.4.6, p.33, and annex 4, table A4.3, pp.433–440).

[4] FCCC/ARR/2016/SVK.

ID[b]	*Issue and or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.3	Key category analysis (G.6, 2016) (G.6, 2015) Transparency	Include in the NIR information on the methodological approach applied for the key category analysis, to justify that the analysis is carried out both with and without LULUCF, in accordance with the UNFCCC Annex I inventory reporting guidelines.	Resolved. The Party reported complete detailed information on the methodological approach applied for the key category analysis in the NIR (chapter 1.2.8, p.36, and annex 1, p.416). The key category analysis has been carried out both with and without LULUCF.
G.4	NIR (G.5, 2016) (G.5, 2015) Transparency	Improve the transparency of the NIR and report on actions taken to improve transparency.	Resolved. In the NIR the Party reported information on the prioritization of inventory improvements (chapter 1.2.4.6, p.33), provided the energy balance from the Statistical Office of the Slovak Republic for 2015 (annex 4, table A4.4, pp.441–448) and reported information on the average carbon stock of deadwood/ha (chapter 6.5.1, p.294) from the 2014 ARR. In addition, all new transparency issues raised during the review of the 2016 annual submission have been addressed and documented in the NIR.
Energy			
E.1	1. General (energy sector) (E.2, 2016) (E.2, 2015) (21, 2014) (19, 2013) Transparency	Provide a brief summary of the national energy balance in the NIR.	Resolved. The Party provided the energy balance, including both electricity and heat, in the NIR (p.441).
E.2	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.19, 2016) (E.19, 2015) Transparency	Include the full national energy balance for the most recent inventory year in the NIR.	Resolved. The Party included the national energy balance for the most recent year in the NIR (p.441).
E.3	1. General (energy sector) (E.4, 2016) (E.4, 2015) (23, 2014) Accuracy	Improve the consistency of the reporting and resolve the discrepancies among the three sources of AD for the reference approach.	Resolved. The Party reported in the NIR (chapter 3.1, p.50) that the single source of AD for the reference approach is the Statistical Office of the Slovak Republic. The Party explained that the differences between the reference and the sectoral approaches are due to the averaging of parameters such as calorific values and oxidation factors.
E.4	Fuel combustion – reference approach – liquid fuels (E.5, 2016) (E.5, 2015) (23, 2014) Transparency	Conduct more detailed analysis of the reasons behind the discrepancies between the reference and the sectoral approach for each individual liquid fuel type and provide the numerical data obtained as a result of such an analysis in the NIR.	Addressing. The Party has conducted a more detailed analysis, but explained in the NIR (chapter 3.3, p.104) that it did not report numerical data on the detailed analysis, by liquid type, of the discrepancies between the reference and sectoral approach. During the review the Party explained that it has held meetings with the Statistical Office of the Slovak Republic, the Ministry of Environment and the State Material Reserves, among others, to improve the source of data for the reference approach and to minimize the difference between the reference and sectoral approach, including for liquid fuels. A table with a numerical

ID[a]	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			analysis was submitted during the review. Slovakia indicated that the analysis was not ready for publication but the results of the QA/QC on the differences will be included in the next NIR.
E.5	Fuel combustion – reference approach – other fossil fuels, peat – CO_2 (E.20, 2016) (E.20, 2015) Accuracy	Examine the data and reduce discrepancies between the reference and sectoral approach to the extent possible and report the outcome of such research in the NIR.	Addressing. The Party reported in the NIR (chapter 3.3, p.104) that an official contract was signed between the Statistical Office of the Slovak Republic and the Ministry of Environment as a platform for addressing discrepancies. Most of the findings to date indicate that discrepancies are caused mainly by the simplifications used in the reference approach.
E.6	Feedstocks, reductants and other non-energy use of fuels – all fuels – CO_2 (E.13, 2016) (E.13, 2015) (28, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Establish new QA/QC routines to govern fuel AD across the inventory, and implement specific AD quality checks to compare the national energy statistics data against the sum of the AD in the energy and industrial processes sectors for all commodities used as fuels, feedstocks or reductants and for other non-energy uses.	Resolved. The Party reported in the NIR (chapter 3.2.3, p.59) on the new QA/QC procedures, which include AD verification by regional environmental offices followed by verification by the Slovak Hydrometeorological Institute Department of Emissions and Air Quality Monitoring.
E.7	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2 (E.22, 2016) (E.22, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Include information on the QA/QC system for feedstocks and non-energy use of fuels in the NIR.	Resolved. The Party reported in the NIR (chapter 3.2.3, p.59) its QA/QC procedures for feedstocks and non-energy use of fuels, including for AD.
E.8	International aviation – liquid fuels – CO_2, CH_4 and N_2O (E.11, 2016) (E.11, 2015) (26, 2014) (24, 2013) Consistency	Investigate the representativeness of the assumed time trends of fuel consumption share between aviation and international bunker fuels throughout the entire time series.	Resolved. The Party has investigated the share of fuel consumption between domestic and international aviation and reallocated consumption based on EUROCONTROL data for 2005–2015 and extrapolation. The ERT agreed that the time series is now consistent. The Party explained in the NIR (chapter 3.2.8.1, p.82, table 3.3.1) the reallocated consumption for jet kerosene and aviation gasoline for the period 1990–2015.
E.9	International aviation – jet kerosene and aviation gasoline – CO_2, CH_4 and N_2O (E.21, 2016) (E.21, 2015) Consistency	Consider whether the newly available EUROCONTROL data for 2005–2014 could be used to inform the expert judgment used for 1990–2004, or alternatively include an explanation of the fluctuation of fuel allocation between domestic and international aviation in the NIR.	Resolved. The Party used a revised, constant fuel share for 1990–2015 obtained from the EUROCONTROL database (see chapter 3.2.8.1, p.82, table 3.3.1).

ID[a]	*Issue and or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
E.10	1.A.1.a Public electricity and heat production – other fossil fuels – CO_2, CH_4 and N_2O (E.23, 2016) (E.23, 2015) Transparency	Provide in the NIR a more transparent and structured description of what is reported under other fossil fuels in the subcategories public electricity and heat production – other (1.A.1.a.iv) and non-metallic minerals (1.A.2.f) and the linkages with the reporting in the waste sector (5.C).	Resolved. The Party reported in the NIR (pp.59–62 and table 3.7) detailed information on the source of AD included in other fossil fuels, including that other fossil fuels (1.A.1.a.iv) includes emissions from combustion of CH_4 from coal mines and waste incineration with energy use. The NIR also reports that industrial waste incinerated in cement kilns is reported under 1.A.2.f.
E.11	1.A.1.b Petroleum refining – liquid and solid fuels – CO_2, CH_4 and N_2O (E.15, 2016) (E.15, 2015) (29, 2014) Transparency	Improve transparency regarding the description of the methodology used for estimating emissions from petroleum refining and the estimation and allocation of the associated emissions in the NIR.	Resolved. The Party reported in the NIR (p.64) that a tier 3 bottom-up methodology was applied, using plant-specific AD and country-specific EFs. The NIR also indicates that no solid fuels are combusted in this category and that emissions are allocated to liquid and gaseous fuels.
E.12	1.A.1.b Petroleum refining – liquid and solid fuels – CO_2, CH_4 and N_2O (E.16, 2016) (E.16, 2015) (31, 2014) Transparency	Include in the NIR the detailed explanations of the methodological choices and recalculations provided during the review in order to increase the transparency of the recalculations.	Resolved. The Party reported in the NIR (chapter 3.2.8.4, table 3.48) the appropriate methodological descriptions. There were no recalculations between the 2016 and 2017 annual submissions for this category. The Party used a tier 3 methodology (NIR, p.64) based on energy and mass balance from the refinery and experimentally determined EFs.
E.13	1.A.1.b Petroleum refining – liquid fuels – CO_2, CH_4 and N_2O (E.24, 2016) (E.24, 2015) Transparency	Provide detailed methodological information on petroleum refining in the NIR, noting that such methodological information could be based on annex 3.2 to the original 2015 NIR of 13 November 2015.	Resolved. The Party reported in the NIR (p.64) that a tier 3 bottom-up approach was used. Plant-specific AD were obtained from Slovnaft refinery and EFs obtained from the laboratory.
E.14	1.A.1.c Manufacture of solid fuels and other energy industries – all fuels – CO_2, CH_4 and N_2O (E.25, 2016) (E.25, 2015) Comparability	Report emissions from coke production under manufacture of solid fuels (1.A.1.c.i) and report own-energy-use emissions from coal mines and oil and gas companies and possible emissions from charcoal production under other energy industries (1.A.1.c.ii), if they can be disaggregated from agriculture/forestry/fishing – stationary.	Addressing. The Party resolved the allocation of emissions from coke production (reported under category 1.A.1.c.i in the 2017 submission; NIR pp.59–61, table 3.7) and own-energy-use at coal mines and oil and gas companies (reported under category 1.A.1.c.ii; NIR p.61). However, emissions from charcoal production were reported under category 1.B.1.b (NIR p.52) and not under category 1.A.1.c.ii.
E.15	1.A.2.a Iron and steel – solid fuels – CO_2, CH_4 and N_2O (E.26, 2016) (E.26, 2015) Transparency	Revise the carbon balance diagram for iron and steel production in the NIR by replacing the reference to 1.A.2.m with 1.A.2.g.viii.	Resolved. Reported in the NIR (p.218, figure A4.1.1) with the correct reference to category 1.A.2.g.viii.

ID[a]	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
E.16	1.A.3.b Road transportation – liquid fuels – CO_2 (E.27, 2016) (E.27, 2015) Transparency	Explain in the NIR that the CO_2 EFs for gasoline and diesel oil used in road transportation are based on country-specific carbon content, which was measured in the laboratories of the Slovak refinery in 2011, and provide the country-specific NCVs, carbon contents and EFs for gasoline and diesel oil used in road transportation in the NIR, preferably in tabular format.	Resolved. The Party reported in the NIR (p.83, table 3.34) the NCVs, obtained from the Slovak refinery, for gasoline, diesel oil, LPG, compressed natural gas, bioethanol and ester used in road transportation. The NIR (chapter 3.2.7.2, p.72, table 3.17) indicates that the EFs are country or plant specific.
E.17	1.A.3.c Railways – diesel – CO_2 (E.28, 2016) (E.28, 2015) Accuracy	Convert the AD (amount of fuel used) from mass units to energy units using the country-specific NCV, and then adopt the default EF from the 2006 IPCC Guidelines (volume 2, table 3.4.1) (74.10 t CO_2/TJ) to calculate CO_2 emissions from railways.	Resolved. The Party has applied a tier 1 methodology, including use of the default CO_2 EF from the 2006 IPCC Guidelines (see NIR, page 87). Country-specific NCVs were presented in NIR table 3.34.
E.18	1.A.3.e.ii Other (other transportation) – CO_2 (E.29, 2016) (E.29, 2015) Consistency	Estimate CO_2 emissions from urea-based catalysts for the entire time series to improve time-series consistency. Report the emissions under the category non-energy products from fuels and solvent use – other (2.D.3).	Resolved. The Party used the COPERT V model to estimate emissions from urea-based catalysts for 2010–2015 (this type of catalyst did not occur before) and reported emissions in category 2.D.3 in CRF table 2(1).A-Hs2.
E.19	1.A.4 Other sectors – all fuels – CO_2 (E.30, 2016) (E.30, 2015) Transparency	Explain in the NIR the process of the energy balance revision and its impact on the emission estimates, where recalculations are carried out because of the revision of the energy balance.	Resolved. The Party reported in the NIR (pp.60 and 106) that revisions of the energy balance are done in occasional cases by the Statistical Unit and that the changes are published in the following year and forwarded to inventory experts (NIR p.60). The Party reported that emissions from coal mines, oil and gas companies were separated from other emissions reported under category 1.A.1.c.i and reported under category 1.A.1.c.ii based on disaggregation in the energy balance while gaseous fuel emissions from category 1.A.4.a were recalculated.
E.20	1.B.2.b Natural gas – gaseous fuels – CH_4 (E.31, 2016) (E.31, 2015) Accuracy	Move to a higher-tier approach in accordance with the decision tree in the 2006 IPCC Guidelines (volume 2, figure 4.2.1).	Not resolved. During the review the Party explained that addressing this recommendation was included in the improvement plan for 2017 but that it was not possible to implement it. The Party also explained that some of the AD and parameters that are needed for a tier 2 methodology are not available in the country.

ID[a]	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
IPPU			
I.1	2.G.1 Electrical equipment – SF_6 (I.14, 2016) (I.14, 2015) Comparability	Use the notation key "IE" for emissions from window insulation, and explain in CRF table 9 that the emissions are included under electrical equipment. Explain in the NIR that SF_6 emissions from window insulation are negligible compared with those from electrical equipment (they only represented 0.09 per cent of total SF_6 emissions in 2014) and that, because the production of windows stopped in 2002, the Party considered it unfeasible to report disaggregated emissions.	Resolved. In CRF table 2(1)s2 and CRF table2(1i)B-Hs2 "IE" was reported for category 2.G.2 and in CRF table 9 it was explained that emissions from other product uses of SF_6 (category 2.G.2) were included in category 2.G.1. The Party also reported this allocation in the NIR (p.215).
Agriculture			
A.1	3. General (agriculture) – N_2O (A.7, 2016) (A.7, 2015) Accuracy	Estimate country-specific Nex values for the complete time series, taking into consideration the development of animal weights, if appropriate, and recalculate the time series of N_2O emissions from manure management and agricultural soils accordingly.	Resolved. The Party estimated country-specific Nex values for non-dairy cattle for the complete time series, taking into account animal weights (NIR pp.264 and 265). The methodology used to calculate Nex was described in the NIR (p.264). The recalculations for manure management and agricultural soils were adequately described in the NIR (NIR chapters 5.8.3 and 5.11.2).
A.2	3. General (agriculture) – N_2O (A.8, 2016) (A.8, 2015) Accuracy	Elaborate country-specific Nex rates for the entire time series for dairy cattle and sheep in accordance with the decision tree in the 2006 IPCC Guidelines (volume 4, figure 10.4). Include in the NIR a description of calculations carried out to derive the country-specific Nex values for dairy cattle and sheep.	Resolved. The Party estimated country-specific Nex rates for dairy cattle and sheep and explained them in the NIR (p.255).
A.3	3.A Enteric fermentation – CH_4 (A.2, 2016) (A.2, 2015) (55, 2014) Transparency	Include in the NIR documentation on the use of country-specific data and the methodology used to estimate CH_4 emissions from enteric fermentation, especially an explanation of the regional differences and their implications for gross energy trends.	Resolved. The Party reported in the NIR (p.244) the use of country-specific data to estimate emissions, and provided methodological information on the regional differences and their implications for gross energy trends.

ID#	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
LULUCF			
L.1	4. General (LULUCF) (L.1, 2016) (L.1, 2015) (66, 2014) (44, 2013) Accuracy	Continue the ongoing technical research in order to provide reliable data for estimating CSC in living biomass, dead organic matter and soil organic matter.	Addressing. No progress has been made on this issue since the previous annual submission. The Party reported in the NIR (p.438) that this recommendation has not been implemented but is planned to be considered for the 2018 annual submission. During the review the Party explained that the research project C-FORLAND was aimed mainly at soil and litter carbon data evaluation and testing. It finished in 2015 and the results were used for the 2016 annual submission (for soil organic carbon and litter). The Party also explained that it is currently analysing the feasibility of improving the information for other pools.
L.2	4. General (LULUCF) (L.6, 2016) (L.6, 2015) (71, 2014) (49, 2013) Transparency	Improve the transparency of the reporting by providing a clear description of the process used to estimate the mean value of soil organic carbon stock for each land-use category and refer to the original data source.	Resolved. The method used to estimate the mean value of soil organic carbon stock for each land-use category has been reported in the NIR, along with the original data source (chapter 6).
L.3	4. General (LULUCF) (L.7, 2016) (L.7, 2015) (72, 2014) (48, 2013) Adherence to the UNFCCC Annex I inventory reporting guidelines	Conduct the tier 1 uncertainty analysis at the land-use subcategory level.	Resolved. Slovakia presented in the NIR (chapters 6.5.5, 6.6.3, 6.7.3, 6.9.3 and 6.10.3) the uncertainty assessment at the land-use subcategory level (see ID# L.10 in table 5).
L.4	4. General (LULUCF) (L.15, 2016) (L.15, 2015) Transparency	Include in the NIR a description of how instantaneous oxidation for CSC in litter for forest land converted to other land-use categories was implemented.	Resolved. The Party explained in the NIR (chapters 6.6.2.1, 6.7.2.1, 6.9.2.1 and 6.10.2.1) how instantaneous oxidation for CSC in litter for forest land converted to other land-use categories was implemented.
L.5	4.A Forest land (L.4, 2016) (L.4, 2015) (69, 2014) Transparency	Include information on the average carbon stock of deadwood/ha in forest land in the NIR.	Resolved. The Party reported in the NIR (chapter 6.5.1) information on the average carbon stock of deadwood/ha.
L.6	4.A.2 Land converted to forest land – CO_2 (L.18, 2016) (L.18, 2015) Accuracy	Provide in the NIR a justification to support the assumption that, according to common afforestation practices, if any vegetation exists in cropland or grassland, it is not removed before conversion to forest land. If such justification cannot be provided, revise the methodology to take into consideration changes in living biomass and deadwood following the land-use change.	Resolved. The Party explained in the NIR (chapter 6.5.3.1, pp.302 and 303) why there is zero tree biomass in grassland or cropland when such land is converted to forest land. The Party explained that for economic reasons land converted to forest land is located exclusively in mountainous regions; therefore, when converted to forest land, grass vegetation is not removed in order to prevent soil erosion. Cropland with living biomass (orchard gardens) is mostly situated close to built-up areas and therefore usually not subject to conversion to forest land.

ID#	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.7	4.B.1 Cropland remaining cropland – CO_2 (L.10, 2016) (L.10, 2015) (75, 2014) Accuracy	Estimate and report the CSCs by disaggregating this category into annual cropland converted to perennial woody cropland and perennial woody cropland converted to annual cropland.	Not resolved. The Party reported in the NIR (p.439, table A4.3) that this recommendation has not yet been implemented but will be in the next annual submission. During the review the Party responded that land-use matrixes with cropland split into annual and perennial categories (1990–2016) will be included in the next annual submission and the methodology will be updated accordingly.
L.8	4.B.1 Cropland remaining cropland – CO_2 (L.12, 2016) (L.12, 2015) (77, 2014) Transparency	Include in the NIR an explanation regarding the use of the notation key "NO" for histosols.	Resolved. The Party provided information in the NIR (chapter 6.6.1.1, p.308) as to why the notation key "NO" was used. Slovakia explained that the total area of organic soils (histosols) represents about 5.5 kha, of which the total area of organic soils for cropland is 2.3 kha (which represent 0.16 per cent of the cropland area). However, the ERT finds that this area should be reported (see ID# L.12 in table 5).
L.9	4.C.2.2 Cropland converted to grassland (L.3, 2016) (L.3, 2015) (68, 2014) (60, 2013) Accuracy	Use default carbon stock values before conversion not only for the annual crops but also for the perennial woody crops, in accordance with the 2006 IPCC Guidelines, for carbon stocks in a range of climate regions for generic perennial woody cropland and considering the area converted from annual crops and perennial woody crops, respectively.	Not resolved. The Party explained in the NIR (chapter 6.5.3.1, p.302) why living biomass and deadwood are assumed to be zero for cropland converted to forest land. However, the recommendation for cropland converted to grassland has not yet been implemented, but will be considered for the next annual submission (NIR table A4.3).
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.9, 2016) (W.9, 2015) Completeness	Improve completeness by including in the inventory emissions from landfilling for waste categories 17–19 (construction and demolition waste; waste from human or animal health care or related research; and waste from waste management facilities, off-site wastewater treatment plants and the preparation of water intended for human consumption and water for industrial use), as provided during the review, for the entire time series.	Resolved. The Party reported the emissions in CRF table 5.A for the entire time series and explained them in the NIR (pp.351–354).
W.2	5.D Wastewater treatment and discharge – CH_4 (W.10, 2016) (W.10, 2015) Transparency	Include the article by Bodik and Kubaska (2013) in the reference list of the related NIR chapter.	Resolved. The Party included the article in the list of references for NIR chapter 7 (p.414).

ID[a]	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
W.3	5.D Wastewater treatment and discharge – CH_4 (W.11, 2016) (W.11, 2015) Transparency	Include information on the data sources regarding the share of sludge applied to agricultural soils, sludge incinerated and sludge deposited to solid waste disposal sites in the NIR or in the documentation box of CRF table 5.D.	Resolved. The Party reported the requested information in the NIR (pp.364–368, table 7.22).
KP-LULUCF			
KL.1	FM – general (KL.6, 2016) (KL.6, 2015) Transparency	Make the improvements required to ensure methodological consistency between the FMRL and the reporting of emissions and removals from FM, particularly in the methodological approach used to estimate the contribution of harvested wood products, including the application of a technical correction to the FMRL.	Not resolved. The Party explained in the NIR (chapter 11.5.2.3, p.401) that technical corrections were not applied. The Party also explained that quantitative and qualitative information on technical corrections will be reported in future national inventories, in accordance with the requirements of decision 2/CMP.7.
KL.2	FM – general (KL.7, 2016) (KL.7, 2015) Transparency	Explain in the NIR that the area reported under LULUCF forest land remaining forest land is larger than the area reported under FM because, under LULUCF, areas afforested prior to 1990 are included in forest land remaining forest land since 2010, whereas afforestation land remains under afforestation and does not move to FM.	Resolved. The Party explained in the NIR (chapter 11.5.1, p.400) the difference between the area of forest land remaining forest land reported under the Convention and the reported FM area under Article 3, paragraph 4, of the Kyoto Protocol: the area of forest land remaining forest land is larger than that for FM because forest land remaining forest land includes afforested areas over the 20-year transition period, whereas under the Kyoto Protocol that area continues to be reported under AR and not under FM.
KL.3	Deforestation (KL.8, 2016) (KL.8, 2015) Transparency	Include in the NIR a description of how instantaneous oxidation was implemented for CSC in litter in areas subject to deforestation.	Resolved. The Party reported in the NIR (p.395) that litter stock under the new land-use category was set to zero with a transition period of one year (instant oxidation).

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including

the review of the 2017 annual submission of Slovakia, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Slovakia

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[b]*
General		
	No such general issues were identified	
Energy		
E.4	Conduct more detailed analysis of the reasons behind the discrepancies between the reference and the sectoral approach for each individual liquid fuel type and provide the numerical data obtained as a result of such an analysis in the next NIR	3 (2014–2017)
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		
L.1	Continue the ongoing technical research in order to provide reliable data for estimating CSC in living biomass, dead organic matter and soil organic matter	4 (2013–2017)
L.7	Estimate and report the CSCs by disaggregating the category into annual cropland converted to perennial woody cropland and perennial woody cropland converted to annual cropland	3 (2014–2017)
L.9	Use default carbon stock values before conversion not only for the annual crops but also for the perennial woody crops, in accordance with the 2006 IPCC Guidelines, for carbon stocks in a range of climate regions for generic perennial woody cropland and considering the area converted from annual crops and perennial woody crops, respectively	4 (2013–2017)
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

[a] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not successive reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year.

V. Additional findings made during the 2017 individual inventory review

9. Table 5 contains findings made by the ERT during the individual review of the 2017 annual submission of Slovakia that are additional to those identified in table 3.

Table 5
Additional findings made during the 2017 individual review of the annual submission of Slovakia

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[a] If yes, classify by type*
General			
G.5	National system	The Party reported in the NIR (chapter 1.2.5, p.33) that there were no significant changes in the arrangements of the national inventory system during inventory year 2016. However, it was also reported in the NIR (chapter 1.2.1.2, p.24) that on 1 January 2017 the structure of the Slovak Hydrometeorological Institute (the single national entity) changed, which resulted in the establishment of the Department of Emissions and Biofuels, which has two main responsibilities: the emission inventory and the national system of biofuels. The ERT noted that decision 15/CMP.1, annex, paragraph 21, requires Parties to include information on changes to its national system in its annual report. The ERT considers that the reporting in the NIR (chapters 1.2.5 and 1.2.1.2) is not fully transparent. During the review the Party explained that NIR chapter 13 (p.407) contains information about the changes referred to above, valid since 1 January 2017. In addition, the Party explained that the structural changes have not had a significant influence on the functionalities of the national inventory system or the single national entity since the number of experts and processes did not change. The ERT recommends that the Party improve the transparency of the reporting regarding the changes in the national system by including in the NIR all changes to the national system, including structural changes.	Yes. Transparency
G.6	Notation keys	The Party reported in the NIR (annex 2, p.421) that several categories (without specifying which) were reported as "NO" because the emissions were below the threshold and measurement range. The ERT noted that this use of "NO" is not in line with the UNFCCC Annex I inventory reporting guidelines, since the categories with emissions considered by the Party to be insignificant should be reported as "NE" with a justification that the likely level of emissions meets the criteria in paragraph 37(b) of those guidelines. The ERT believes that this issue should be considered further in future reviews to confirm that there is no underestimation of emissions. The ERT recommends that the Party report all emissions considered insignificant as "NE" and justify that the likely level of those emissions is below the threshold indicated in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. The ERT also recommends that the Party review and, if necessary, revise the information in annex 2 to the NIR regarding the use of the notation key "NO" to report emissions that are considered negligible or outside the measurement range.	Yes. Completeness

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
G.7	QA/QC and verification	The Party reported in the NIR (chapter 1.2.4.4) that it is implementing QA procedures at different levels, including basic review of the draft report, public review, external peer review, internal audit, and European Union and UNFCCC reviews. The Party also indicated in the NIR (p.32) that part of the QA procedures is bilateral cooperation with Czechia. The ERT considers that the Party did not provide a clear indication of how and in which sequence the QA was performed and did not clearly state that the QA reviewers were not involved in the preparation of the inventory. The ERT notes that providing such information represents good practice in line with the 2006 IPCC Guidelines (volume 1, chapter 6.8). During the review the Party explained that the QA activities are in accordance with the 2006 IPCC Guidelines and involved stakeholders outside of the national inventory system since all NIR chapters and sectoral CRF tables are checked, verified and approved by experts from the Ministry of Environment (each sector has a different reviewer). The ERT recommends that the Party increase transparency regarding the reporting of the general QA procedures and provide in the NIR more information on the sequence of the QA procedures as well on the experts/stakeholders involved.	Yes. Transparency
Energy			
E.21	Fuel combustion – reference approach – peat	The Party reported CO_2 emissions from peat in the sectoral approach for 2011–2015, specifically for category 1.A.2.d (e.g. 15.35 kt CO_2 eq for 2015), but reported emissions from peat in the reference approach as "NA, NO" in CRF table 1.A(c). The NIR (p.106) indicates that there is one company that uses peat as fuel but that peat is not a fuel type in the energy balance obtained from the Statistical Office of the Slovak Republic. During the review the Party explained that the notation key for the reference approach was not chosen correctly, because there is no consumption of peat that can be reported in the reference approach. The Party further explained that peat fuel is not identified in the national statistical balance compiled by the Statistical Office of the Slovak Republic and is included with the consumption of lignite in the reference approach. The Party indicated that in the next submission peat will be categorized correctly and its consumption will be included in the reference approach. The ERT recommends that the Party report peat consumption and the associated emissions in the reference approach for 2011 onward.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
E.22	Fuel combustion – reference approach – biomass	The ERT noted that CRF table 1.A(b) reports 43,000 TJ liquid biomass consumption for 2002 compared with 120 TJ reported to IEA. During the review the Party confirmed that biomass fuel consumption reported in the reference approach was incorrect for 2002. The Party indicated that this will be corrected in the next annual submission using data from Eurostat and that the Party will include validation of all biomass fuels in the improvement plan. The ERT encourages the Party to correct the error in the liquid biomass energy consumption reported in the reference approach for 2002 in CRF table 1.A(b).	Not an issue/problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
E.23	1.A.1.a Public electricity and heat production – other fossil fuels – CO_2, CH_4 and N_2O	NIR table 3.9 (p.66) compares the amount of municipal solid waste incinerated with energy recovery reported by Eurostat and in the data from a publication by the Statistical Office of the Slovak Republic. The ERT noted that the data differ significantly (e.g. for 2015 Eurostat reports 625 TJ and 1,043 TJ for biogenic and fossil waste, respectively, while the national publication reports 1,504 TJ and 382 TJ). The NIR indicates that there is not a consistent approach to reporting the fossil and biogenic share in energy units (TJ) because the data from the Statistical Office of the Slovak Republic include parts of industrial solid waste incinerated and the data use different assumptions on waste composition. The ERT encourages the Party to engage with the Statistical Office of the Slovak Republic to minimize the discrepancies for municipal solid waste incinerated between the Eurostat data and the Statistical Office of the Slovak Republic data.	Not an issue/problem
E.24	1.A.1.a.iv Other (public electricity and heat production) – CH_4 and N_2O	The ERT noted that the production of industrial waste (non-biomass fraction) reported in the CRF tables is up to 95 per cent less than that reported to IEA for 1990–2002 and for 2013 onward (e.g. for 2015 the Party reported 4,381.64 TJ in CRF table 1.A(b) but the IEA data report 7,946.46 TJ). The ERT also noted that the IEA data for other non-fossil fuels (biogenic waste) were higher by almost the same magnitude. During the review the Party explained that this category (1.A.1.a.iv) includes the balance for the difference in industrial waste combusted between EU ETS data and the national energy balance and also the municipal waste incinerated. The Party also explained that it had already identified inconsistencies in the reporting for industrial waste and included correcting these inconsistencies in the improvement plan for 2017, as stated in the NIR (chapter 3.2.6.1). The Party further explained that, during 2017, it performed a detailed analysis of its industrial waste consumption and composition but postponed incorporating the final results to the next annual submission. The Party indicated that it will minimize the discrepancies, validate the AD for municipal waste and compare the method used by the Statistical Office of the Slovak Republic and waste experts to estimate the non-biomass fraction. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions. The ERT recommends that the Party implement the planned improvement highlighted in the NIR (chapter 3.2.6.1), validate the AD for municipal and industrial solid waste incineration and improve the estimation of the ratio of fossil fuel to biomass of the waste incinerated.	Yes. Accuracy
E.25	1.A.1.c Manufacture of solid fuels and other energy industries – solid fuels – CO_2	The ERT noted that the CO_2 IEF for 2015 is 191.31 t/TJ and is among the highest reported by Parties in their 2017 inventories (19.14–191.31 t/TJ for 2015). The Party indicated that the IEF for CO_2 is so high because blast furnace gas represents more than 95 per cent of total fuels in this category and it has a high carbon content. During the review the Party explained that there are two main fuels in this category (coking gas and blast furnace gas) and that information about consumption of those gases was obtained directly from the iron and steel producer (operator), while the EFs and NCVs were estimated by an accredited laboratory and provided directly by the operator. The ERT recommends that the Party explain in the NIR the high value of the CO_2 IEF for this category and how it was obtained.	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[b] If yes, classify by type
E.26	1.A.2.a Iron and steel – liquid fuels – CH_4	The ERT noted that the CH_4 IEF for emissions from liquid fuels varies significantly across the years 2009–2015, ranging from 1.01 to 3.00 kg/TJ. During the review the Party indicated that the inter-annual change in the CH_4 IEF is proportional to the changes in the consumption of residual fuel oil and LPG. The Party also explained that it performed a detailed analysis of liquid fuels for this category using AD from EU ETS reports and a disaggregated energy balance. The Party explained that there was no consumption of LPG between 1990 and 2009. The Party indicated that in 2009 there was one company with a low consumption of natural gas and LPG and that there was an increase in LPG and natural gas consumption, but in 2012 the company stopped LPG combustion. The Party provided details on the CH_4 emission estimation in the last three years in response to an ERT question. The data indicated that the inter-annual fluctuation in the IEF was caused mainly by the change in the ratio of residual fuel oil to LPG consumption. The Party explained that some of these data are confidential. The ERT recommends that the Party explain the trend in the CH_4 IEF, especially for 2009 onward, by including information on the trends in LPG and residual fuel oil consumption or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trend in the CH_4 IEF.	Yes. Transparency
E.27	1.A.2.e Food processing, beverages and tobacco – liquid fuels – CO_2, CH_4 and N_2O	The ERT noted that the IEFs for 2008–2015 for liquid fuels were approximately 64 t/TJ for CO_2, 1 kg/TJ for CH_4 and 0.1 kg/TJ for N_2O. The figures are among the lowest of reporting Parties (61.18–79.87 t/TJ for CO_2, 0.28–8.59 kg/TJ for CH_4 and 0.10–4.92 kg/TJ for N_2O). During the review the Party indicated that the only liquid fuel in this category is LPG and that before 2008 several units also used fuel oil as fuel. The Party also indicated that the main source of emissions from liquid fuels was one company, that the fuel oil consumption of that company decreased from 21,650 to 589 t in 2007, and that AD are from EU ETS reports and the disaggregated energy balance provided by the Statistical Office of the Slovak Republic. The Party further indicated that the company currently uses a small amount of fuel oil and therefore the IEF is dominated by the contribution of LPG. Slovakia indicated that the NCVs and CO_2 EF for fuel oil were estimated as weighted averages from EU ETS reports, while the CO_2 EF for LPG is based on a default value taken from the reference approach. The Party indicated that the EFs for CH_4 and N_2O are default EFs from the 2006 IPCC Guidelines. The Party explained that some of these data are confidential. The ERT recommends that the Party explain in the NIR the trend in and sources of the CO_2, CH_4 and N_2O IEFs for 2008 onward and the fuel oil and LPG consumption or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trends in the CO_2, CH_4 and N_2O IEFs.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
E.28	1.A.2.e Food processing, beverages and tobacco – solid fuels – N_2O	The ERT noted that the IEF for N_2O emissions from solid fuels for 2015 is 1.42 kg/TJ, which differs from the constant IEF reported for the previous years (1.50 kg/TJ) and is among the lowest of reporting Parties (ranging from 0.10 to 3.86 kg/TJ). During the review Slovakia explained that the IEF changed for 2015 because one plant started to use a small amount of coke and not hard coal. The Party explained that some of these data are confidential. The ERT recommends that the Party explain the change in the N_2O IEF for 2015 by reporting the change in solid fuel consumption and the EF considered for each fuel or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trend in the N_2O IEF.	Yes. Transparency
E.29	1.A.2.f Non-metallic minerals – solid fuels – CH_4	The ERT noted that for 2015 the CH_4 IEF for solid fuels was 9.07 kg/TJ and that this is among the lowest of reporting Parties (around 10.0 kg/TJ). Slovakia indicated that the AD were based on EU ETS data and reports of the Statistical Office of the Slovak Republic indicated that there are three companies that use small amounts of coke (with a low CH_4 EF) as an alternative fuel to hard coal. During the review the Party indicated that three plants reported coke consumption in 2015. The Party explained that some of these data are confidential. The ERT recommends that the Party explain in the NIR the trend in the CH_4 IEF by detailing the different fuels and their consumption and the source of AD and EFs or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trend in the CH_4 IEF.	Yes. Transparency
E.30	1.A.2.g Other (manufacturing industries and construction) – solid fuels – CH_4 and N_2O	The ERT noted that the IEFs for CH_4 and N_2O emissions from solid fuels were almost constant for 1990–2012 (1.11 kg/TJ and 0.118 kg/TJ, respectively). However, there were changes in the IEFs for CH_4 and N_2O for 2013–2015 (e.g. for 2015 the IEFs were 1.14 kg/TJ and 0.122 kg/TJ, respectively). During the review the Party indicated that there are only six companies that use solid fuels. Three of them use lignite, two of them use coke and one company uses other bituminous coal. The consumption of these individual fuels is very small and the fluctuation in the CH_4 and N_2O IEFs is proportional to the share of coke. The Party reported that AD for all companies are from the Statistical Office of the Slovak Republic because those emissions are not included in the EU ETS due to their low level. The Party explained that some of these data are confidential. The ERT recommends that the Party explain in the NIR the trend in the CH_4 and N_2O IEFs by detailing the source of AD and EFs and the different fuels consumed in different years, particularly the changes observed starting at the end of 2012 or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trends in the CH_4 and N_2O IEFs.	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
E.31	1.A.2.g.viii Other (manufacturing industries and construction) – liquid fuels – CO_2 and CH_4	The ERT noted that the IEFs for CO_2 and CH_4 were constant for 1990–2012 (65.82 t/TJ and 1.48 kg/TJ, respectively) but variable for 2013–2015 (e.g. for 2015 the IEF were 67.39 t/TJ and 1.78 kg/TJ, respectively). During the review Slovakia indicated that there were no changes in the sources of AD or EFs during 2013–2015 and the reason for the change in IEFs is the significant increase of diesel oil consumption in one plant. The Party also indicated that the fuel consumption is provided by the operator in EU ETS verified reports and that the consumption data were compared with those in the national database (National Emission Information System of the Slovak Republic) and the reported consumption is the same. The ERT recommends that the Party explain in the NIR the trend in the CO_2 and CH_4 IEFs by detailing the different fuels consumed in different years.	Yes. Transparency
E.32	1.A.3.a Domestic aviation – aviation gasoline – CH_4	The ERT noted that the CH_4 IEF for aviation gasoline was constant (0.65 kt/TJ) for 1990–2004 but it varied annually (between 0.65 kg/TJ and 0.74 kg/TJ) for 2005–2015. During the review the Party indicated that it used EUROCONTROL data for the emission estimates for the years 2005–2015 but it used the tier 1 landing and take-off cycle methodology for 1990–2004 (based on fuel consumption data directly from the airports and, as EF, the average of the EFs for 2005–2015). The ERT recommends that the Party demonstrate that the time series is consistent in accordance with the 2006 IPCC Guidelines.	Yes. Consistency
E.33	1.A.3.b.i Cars – LPG – N_2O	The ERT noted that the N_2O IEF for LPG for the period 2006–2015 ranges between 2.25 kg/TJ and 2.79 kg/TJ (2.25 kg/TJ for 2015) and that it is among the highest of reporting Parties, including neighbouring countries (e.g. 0.58 kg/TJ for Austria, 0.20 kg/TJ for Czechia and Hungary, and 2.67 kg/TJ for Poland). The NIR (p.84) indicates that the N_2O EF is calculated automatically by the model (COPERT) using input parameters such as the average speed, the quality of fuels, the age of vehicles, the weight of vehicles and the volume of cylinders. During the review, the Party indicated that comparison with other countries can be done only if they use the COPERT model (e.g. Poland). The Party also explained that it performed a comparative analysis of the N_2O EFs with those of other European countries that use the COPERT model and that the Slovak emissions are in agreement with the national and regional circumstances. The ERT recommends that the Party review and explain in the NIR the N_2O IEF for LPG for cars in road transportation. The ERT encourages the Party to include the result of the Party's analysis of differences between the Party's EF and values of comparable Parties and the 2006 IPCC Guidelines.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
E.34	1.A.3.b.ii Light-duty trucks – liquid fuels – CH_4 and N_2O	The ERT noted that the CH_4 IEF for diesel oil consumed in light-duty vehicles declined from 1.8 kg/TJ for 2000 to below 1.0 kg/TJ for 2011–2015. For the same period the N_2O IEF increased from 0.06 kg/TJ to 1.8 kg/TJ. During the review the Party indicated that CH_4 emissions are gradually decreasing for all vehicle categories, including light-duty vehicles, owing to changes in the vehicle fleet. Newer vehicles are emitting fewer hydrocarbon pollutants, to which oxidation catalysts contribute. CH_4 behaves just like other hydrocarbons, so it declines, resulting in a decline in the IEF. The emissions of N_2O are slowly increasing for light-duty vehicles (diesel) owing to NOx reduction devices. The ERT recommends that the Party clarify the trend in the CH_4 and N_2O IEF by explaining that changes in the vehicle fleet resulted in fewer hydrocarbon emissions (including CH_4) but more N_2O emissions (as a result of the reduction in NOx emissions).	Yes. Transparency
E.35	1.A.3.b.v Other (urea-based catalysts) – CO_2, CH_4 and N_2O	The ERT noted that the cells for AD and emissions are blank in CRF table 1.A(a)s3. During the review the Party indicated that AD and emissions were reported as "IE" in the CRF Reporter but that a malfunction resulted in the CRF tables generated not including that notation key. As noted in ID# E.18 in table 3, emissions from urea used as a catalyst are now reported under category 2.D.3. The ERT recommends that the Party ensure that the proper notation key "IE" is reported for urea-based catalysts and that use of the notation keys is explained in the NIR and CRF table 9.	Yes. Comparability
E.36	1.A.4 Other sectors – solid fuels – CH_4	The ERT noted that CH_4 emissions from solid fuels were identified as a key category in terms of trend, excluding and including LULUCF. The Party reported in CRF summary table 3s1 that a tier 1 method and default EF were used. During the review the Party explained that it was aware that it should use a higher-tier method for key categories. However, the Party was unable to adopt a higher-tier estimation method for this category except for CO_2 owing to lack of resources. The Party indicated that CH_4 emissions from other sectors (1.A.4) has not been identified as a key category by level since the 1990s. The Party reported that the number of industrial plants where there is continuous measurement of CH_4 and N_2O emissions is limited in Slovakia, which does not facilitate the estimation of emissions using a higher tier. The Party explained that it started a research project focused on the estimation of solid fuel incineration in households in 2017 and intends to use the outcomes of the project to increase the estimation tier for category 1.A.4.b. The ERT recommends that the Party estimate and report CH_4 emissions from solid fuels for category 1.A.4 using at least a tier 2 methodology (in accordance with the 2006 IPCC Guidelines) if the emissions are identified as key, and if this is not practical, explain in the NIR any national circumstances that may affect this issue.	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
E.37	1.A.4.c.i Stationary – biomass – CO_2	The ERT noted the declining trend in the CO_2 IEF for biomass, from 96.89 kg/TJ in 1996 to 67.09 kg/TJ in 2015. During the review the Party indicated that the main biofuels included are wood, other solid biomass and biogas. The Party also indicated that, before 2009, the main fuels were wood and wood waste, and therefore the IEF was around 100 kg/TJ. In 2011 biofuel consumption increased significantly. Several biogas stations have started operations in the last five years. Wood consumption has remained practically constant but there has been a significant increase in biogas consumption, with a lower CO_2 EF. The Party explained that for 2015 the consumption of wood was 5 per cent, other solid biomass 25 per cent and biogas 70 per cent. The Party explained that some of these data are confidential. The ERT recommends that the Party explain in the NIR the trend in the CO_2 IEF by detailing the consumption trends for the different biomass types or, if this is not possible because some of the data are confidential, explain which data are confidential and the specific domestic legislation that makes them confidential and the underlying reasons for the trend in the CO_2 IEF.	Yes. Transparency
E.38	1.B.2.a Oil – liquid fuels – CO_2, CH_4 and N_2O	The Party reported CO_2 and N_2O emissions from oil refining/storage (1.B.2.a.4) and CO_2 and CH_4 emissions from distribution of oil products (1.B.2.a.5) as "NO". During the review the Party indicated that these activities are occurring in the country but emissions were not estimated since the 2006 IPCC Guidelines do not include methodologies for estimating them. The ERT recommends that the Party report CO_2 and N_2O emissions from oil refining/storage (1.B.2.a.4) and CO_2 and CH_4 emissions from distribution of oil products (1.B.2.a.5) as "NE" and explain in the NIR that the activities occur in Slovakia but emissions were not estimated because the 2006 IPCC Guidelines do not include methodologies to estimate them.	Yes. Comparability
IPPU			
I.2	2.A.2 Lime production 2.A.4 Other uses of carbonates – CO_2	The ERT noted that the NIR contained some inconsistencies between numbers in the text and tables (e.g. on p.142, CO_2 emissions from lime for 2015 were reported as 638 kt and also 648 kt; and in NIR table 4.15, the reported 2014 value for used carbonates for magnesium carbonate is 4.33 kt instead of 8.33 kt). During the review the Party acknowledged these inconsistencies and explained that they were typing errors. The ERT recommends that Slovakia correct the errors identified in the reporting for CO_2 emissions from lime (for 2015, reported as 638 kt but also as 648 kt in NIR chapter 4.6.3.2) and for magnesium carbonate used (for 2014, NIR table 4.15 reported 4.33 kt instead of 8.33 kt).	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
I.3	2.A.3 Glass production – NMVOCs and CO	The Party reported in the NIR (p.142) NMVOC and CO emissions from this category as "IE" and allocated the emissions to category 1.A.2.f; however, no rationale for this reporting was provided. During the review the Party explained that the allocation was based on the use of the Convention on Long-range Transboundary Air Pollution inventory methodology. These two precursor gases were reported in that inventory as "IE" and allocated to category 1.A.2.f, and the same allocation was made in the NIR and in the CRF tables. The ERT encourages the Party to allocate NMVOC and CO emissions to this category or explain in the NIR the reasons for reporting these emissions as "IE" and allocating the emissions to category 1.A.2.f.	Not an issue/problem

ID*	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? If yes, classify by type
I.4	2.B.1 Ammonia production – CO_2	The Party reported (NIR p.151; CRF tables 2(I).A-Hs1 and s2 and 3.G-1) that it reports CO_2 removals from urea production in category 2.B.1 (ammonia production) and that it reports CO_2 from urea use in categories 2.D.3.d (urea catalytic converters, reported under other (non-energy products from fuels and solvent use)) and 3.H (urea application, under the agriculture sector). The ERT noted that this may not be in accordance with the 2006 IPCC Guidelines (volume 3, chapter 3.2) because the reported CO_2 removals for urea production (e.g. 246.24 kt CO_2 recovered from ammonia production for 2015 in CRF table 2(I).A-Hs1) are four times higher than the reported CO_2 emissions from urea use (62.21 kt CO_2, the sum of 1.29 kt CO_2 emissions from urea used in catalytic converters reported for category 2.D.3 in CRF table 2(I).A-Hs2 and 60.92 kt CO_2 emissions from urea application reported for category 3.H in CRF table 3.G-1) and may indicate an overestimation of the CO_2 recovered or an underestimation of the CO_2 emissions from urea use. During the review the Party explained that there is no overestimation of removals because the difference is caused by the export of urea; however, the Party acknowledged that so far only the amount of urea imported is monitored in Slovakia, not the amount exported. The ERT believes that this issue should be considered further in future reviews to confirm that there is no underestimation of emissions. The ERT recommends that the Party revise the AD and emissions and removals associated with urea production and use and explain in the NIR the reasons for the difference between the CO_2 recovered in category 2.B.1 ammonia production (recovered for urea production) and CO_2 emissions from urea use reported in categories 2.D.3 and 3.H. The ERT also recommends that the Party include information in the NIR on the import-export-production-use balance of urea.	Yes. Accuracy
I.5	2.B.8.b Ethylene – CO_2	The Party reported that CO_2 emissions from ethylene production (2.B.8.b) occur in the country (NIR p.158; CRF table 2(I).A-Hs1). The ERT noted that the Party reported that the ethylene production process uses low-pressurized CH_4, but it did not report on the source of the CH_4 nor if there was a possible double counting with the energy sector. During the review the Party explained that the low-pressurized CH_4 was derived from refinery gases and used as input in the ethylene process. The Party indicated that this should have been included under refinery feedstocks in CRF table 1.A(d) instead of under natural gas liquids and that the reallocation will not affect the total carbon stored from liquid fuels. The ERT noted that ethylene production releases gases that are consumed in the refinery. The ERT considers that the carbon exchanges between both processes are not transparently reported. During the review the Party explained that emissions from refineries are calculated using fuel inputs as per the 2006 IPCC Guidelines and are not based on a carbon balance, and that the combined emissions from the ethylene and refinery plants are verified against the emissions of each plant (reported under the EU ETS) and no differences occur. The ERT recommends that the Party provide in the NIR more information on the origin of input and output carbon flows of the ethylene process to ensure consistency with the energy balances in the energy sector and the correct allocation of feedstocks in CRF table 1.A(d).	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
I.6	2.B.8.c. Ethylene dichloride and vinyl chloride monomer – CO_2	The Party reported ethylene dichloride production at –0.158 kt, a negative value (NIR p.161, table 4.34). The ERT noted that ethylene dichloride is an input to the production of vinyl chloride monomer. The Party reported that there is only one producer in Slovakia (NIR p.160). During the review the Party explained that the values for ethylene dichloride production reported in NIR table 4.34 represent the amount of ethylene dichloride produced above the requirements for the production of vinyl chloride monomer at the only plant in the country: a positive value means that production of ethylene dichloride from ethylene was higher than was needed for the production of vinyl chloride monomer and a negative value means that the production of ethylene dichloride was not sufficient for the vinyl chloride monomer production in that year and it was necessary to add ethylene dichloride from other sources to the production process. The ERT noted that this transparency issue in the NIR does not affect the CO_2 emission estimates reported for this category in the CRF tables, where the ERT did not find any issues. The ERT recommends that the Party explain the meaning of the amounts of ethylene dichloride production reported in the NIR by clarifying that there is only one producer of ethylene dichloride and vinyl chloride monomer in the country and that negative values for the production indicate that the plant needed to add ethylene dichloride not produced at the plant.	Yes. Transparency
I.7	2.B.10 Other (chemical industry) – CO_2	The ERT noted the inter-annual variability of the CO_2 IEF for hydrogen production (reported under category 2.B.10 other (chemical industry)); for example, 10.25 t CO_2/t for 2010 but 8.86 t CO_2/t for 2011, and 9.56 t CO_2/t for 2013 but 8.96 t CO_2/t for 2014 (NIR p.163; CRF table 2(I).A-Hs1). The NIR indicates that natural gas is used in hydrogen production as both feedstock and energy source, but all natural gas consumption is reported under category 2.B.10. During the review the Party explained that the only hydrogen production plant in the country was revamped in 2010, which resulted in a higher IEF in 2010 and lower IEF in the subsequent years. Moreover, the Party explained that the IEF can fluctuate because not all produced hydrogen is sold; the unsold hydrogen is combusted at the plant where it is produced, together with the CO from the hydrogen production process. CO_2 emissions from the combustion of the CO are included in the emissions from hydrogen production because all carbon from the used natural gas is reported in this category. The ERT recommends that the Party justify the inter-annual variability of the CO_2 IEF for hydrogen production by explaining that the only hydrogen production plant in the country was revamped in 2010, which resulted in a higher IEF in 2010, and that the IEF fluctuates because CO_2 emissions from the CO (from the hydrogen production) combusted with the unsold hydrogen are reported under this category.	Yes. Transparency
I.8	2.C.2 Ferroalloys production – CO_2	The Party reported in the NIR (p.171) that it used subscripts in its uncertainty formula to identify separate sources. However, the formula does not contain any subscripts. During the review the Party explained that mentioning subscripts was incorrect. The ERT recommends that the Party remove the reference to subscripts when explaining the formula used for estimating uncertainties for this category.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
I.9	2.D.3 Other (non-energy products from fuels and solvent use) – CO_2	The Party reported the AD used to estimate CO_2 emissions from urea consumption in transport as "NA" in CRF table 2(I).A-Hs2. During the review the Party responded that no AD on urea were used in the estimation because it followed the recommendation for the estimation of urea usage in the *EMEP/EEA air pollutant emission inventory guidebook* for road transportation. The assumption according to the guidebook was that all EURO 5 and 6 diesel oil passenger and heavy-duty vehicles use urea to reduce NOx. Urea use is assumed to be 5–7 per cent of fuel consumption for EURO 5 and 3–4 per cent for EURO 6. These percentages were already incorporated in the COPERT model as default values. Therefore the Party assumed that there is no need to apply AD on urea in estimating CO_2 emissions. The ERT recommends that the Party report the AD used in the estimation of CO_2 emissions from urea used in catalytic converters (i.e. equal to 5–7 per cent of fuel consumption for EURO 5 and 3–4 per cent for EURO 6 diesel oil passenger and heavy-duty vehicles) and explain in the NIR how those CO_2 emissions are estimated.	Yes. Transparency
I.10	2.D.3 Other (non-energy products from fuels and solvent use) – CO_2	The Party reported that it does not account for CO_2 emissions from urea use in stationary applications (NIR p.180). The ERT noted that, owing to European Union legislation and regulation, stationary large combustion plants need to comply with NOx emission limits, and therefore the ERT considers that these plants may use flue gas cleaning devices based on urea. During the review the Party confirmed that no urea for this purpose was used in 2015 or previously. The Party explained that the possibility of using urea in stationary applications is monitored annually. The Party also explained that several stationary combustion plants are planning to start using a technology using urea from 2016 onward. The ERT recommends that the Party explain that no large combustion plants use urea-based treatments to comply with NOx limits and that the Party is monitoring annually this potential use.	Yes. Transparency
I.11	2.F.1 Refrigeration 2.F.3 Fire protection – HFCs	From the data in CRF table 2(II)B-Hs2 on new fillings, stocks, disposal and recovery and emissions from new fillings, stocks and disposal, the ERT estimated the inter-annual flow per substance, but the results were different from the flows reported by the Party. During the review the Party explained that this apparent inconsistency is due to the fact that not all information can be given in the CRF tables. The information missing from the CRF tables is the amount filled in appliances that were exported. The Party provided the ERT with the calculation models for various substances, which included exports and which presented a consistent time series. The ERT commends the Party for its willingness to share its calculation models. The ERT recommends that the Party increase the transparency of the reporting of AD and emissions for categories 2.F.1 and 2.F.3 by explaining in the NIR that exports of filled products are considered in the calculations but this information cannot be included in the CRF tables.	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
I.12	2.F.3 Fire protection – HFC-134a	The Party reported HFC-134a emissions for this category for 1994 onward (AD and emissions were reported as "NO" for 1990–1993). The ERT noted an inconsistency in the time series linking new fillings, the operational stock and emissions from fillings and stock between 1994 and 1995 as reported in CRF table 2(II)B-Hs2: the stock in 1995 was estimated considering the stocks in 1994 only, but not the new stocks (from new fillings). For the later years of the time series this inconsistency does not occur as there are no new fillings reported after 1994, that is, the stock in year t is estimated correctly by deducting the emissions from the stock in year t-1 from the stock in year t-1. During the review the Party explained that there was indeed an error in the 1995 data, leading to a small overestimation of emissions from stocks for 1995 onward (<0.0001 t HFC-134a). The ERT recommends that the Party correct the emission estimation for HFC-134a stocks for 1995 and revise the time series for HFC-134a for 1995 onward and explain the recalculation.	Yes. Accuracy
I.13	2.F.4 Aerosols 2.F.5 Solvents – HFCs	The ERT noted that the Party reported in its NIR (p.208 for category 2.F.4 and p.211 for 2.F.5) that it applied the default methodology from the 2006 IPCC Guidelines with an annual EF of 0.5 (thus assuming that 50 per cent of the emissions from equipment sold in year t will be emitted equally during the same year and 50 per cent the following year). However, in NIR tables 4.92 (for category 2.F.4) and 4.94 (for 2.F.5) and in CRF table 2(II)B-Hs2, a product life factor of 1 was applied on the operational stock in year t (for 2000 onward for category 2.F.4 and for 1997–2006 for 2.F.5). During the review the Party explained that it assumes that from the annual sales, half of the HFC is emitted in the year of sales, and half of it in the following year and that amount is added to the stock (or bank as called in the NIR). The next year, half of that year's sales is added to the stock, while the other half is emitted together with the remaining half of the previous year's sales. This is in accordance with the 2006 IPCC Guidelines. The applied methodology can also be summarized as follows: Emissions in year t = 50 per cent of sales in year t-1 + 50 per cent of sales in year t; Stock (or bank) in year t = 50 per cent of sales in year t-1 + 50 per cent of sales in year t; So emissions and stocks in year t are identical; therefore an EF of 1 can be applied to the annual stock. The ERT recommends that the Party improve the explanation of the methodology applied to estimate emissions and stocks for categories 2.F.4 (especially for 2000 onward) and 2.F.5 (especially for 1997–2006) e.g. by providing a numerical example clarifying the applied approach and applied lifetime factor.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
Agriculture			
A.4	3. General (agriculture) – CH_4 and N_2O	In the NIR (p.243) Slovakia reported that CH_4 emissions from enteric fermentation of cattle were estimated on the basis of a detailed classification of animals (dairy cattle (high-producing dairy cows, calves of six months, heifers, pregnancy heifers, oxen, breeding bull and fattening) and meat cattle (suckling cows, calves of six months, heifers, pregnancy heifers, breeding bull, oxen and fattening)). However, a different classification for dairy cattle was reported in NIR tables 5.9, 5.21, 5.27, 5.28 and 5.34 and for non-dairy/beef cattle in NIR table 5.34. During the review Slovakia explained that the country-specific cattle classification (NIR tables 5.21, 5.27 and 5.28) and the recommended classification of the 2006 IPCC Guidelines (used in NIR tables 5.10 and 5.12) are connected through the country-specific methodology used to estimate emissions. The Party also explained that it reported emissions from cattle in accordance with the 2006 IPCC Guidelines (volume 4, chapter 10.2.2) and that the dairy cow population is estimated separately from the population of other cattle categories. The ERT recommends that Slovakia explain in detail in the NIR the cattle subcategories used in the estimations and the source of the population data and the methodologies used to estimate the emissions from each subcategory.	Yes. Transparency
A.5	3. General (agriculture) – CH_4 and N_2O	In the 2016 NIR (p.252, table 5.22) Slovakia reported that the population of swine for 1990 was 2,035,000 heads. However, in the 2017 NIR (p.252, table 5.22) the Party reported a swine population of 2,520,524 for 1990, which is 23.58 per cent higher than the population reported in the 2016 NIR. During the review Slovakia explained that, in the 2016 and previous annual submissions, the swine population for 1990–2005 was extrapolated (as reported in the 2016 NIR) because no data were available. For the 2017 annual submission, more accurate population data for 1990–2005 were prepared in collaboration with the Statistical Office of the Slovak Republic. The Party also explained that the methodology used by the Statistical Office of the Slovak Republic to fill the data gap was the standard statistical approach for extrapolation, which is reviewed by Eurostat (available at http://ec.europa.eu/eurostat/product?code=KS-32-11-955&mode=view&language=en). The ERT recommends that Slovakia explain in the NIR how it estimated the swine population for 1990–2005, including procedures for gap filling using extrapolation.	Yes. Transparency
A.6	3.A.1 Cattle – CH_4	In NIR table 5.18 (CH_4 emissions from enteric fermentation according to the livestock in particular years) Slovakia reported the time series of CH_4 emissions from enteric fermentation for dairy cattle. However, the values reported do not match the values reported in NIR table 5.22 (impact of recalculations, new input data and CH_4 emissions in 1990–2014 for dairy cattle and swine). During the review Slovakia explained that in NIR table 5.22 the headings for the columns for 2016 and 2017 are incorrect: the heading "2016 submission" should read "2017 submission" and vice versa. The Party also explained that NIR table 5.18 shows the correct values for emissions from dairy cattle. The ERT recommends that Slovakia correct NIR table 5.22 to show the correct CH_4 emissions from dairy cattle for the entire time series and ensure that NIR tables 5.18 and 5.22 show consistent values for CH_4 emissions.	Yes. Transparency.

ID=	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[20] If yes, classify by type
A.7	3.B.2 Sheep – CH_4	In NIR table 5.26 (overview of country-specific parameters for cattle and sheep for 2015; NIR p.256) Slovakia reported that the VS daily excretion used to estimate CH_4 emissions from manure management for other mature sheep is 0.408 kg dm/head/day. However, in CRF table 3.B(a)s1 the VS daily excretion reported is different (6 kg dm/head/day for the entire time series). During the review Slovakia explained that the value reported in NIR table 5.26 is correct and that the value reported in the CRF tables is incorrect. The Party confirmed that the CH_4 emissions from manure management for other mature sheep reported in CRF table 3.B(a) are correct. The ERT recommends that Slovakia report the correct value for VS daily excretion (0.408 kg dm/head/day) in CRF table 3.B(a), ensuring the consistency of this value with the value reported in the NIR.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
A.8	3.B.3 Swine – CH_4	The Party estimated CH_4 emissions from manure management for swine using a tier 1 methodology and default EF (NIR p.245). The ERT noted that this is not in accordance with the 2006 IPCC Guidelines because manure management (CH_4) is a key category and swine are the biggest contributor to CH_4 emissions (e.g. 68.2 per cent for 2015). During the review Slovakia acknowledged that swine is a significant animal category for manure management. The Party explained that using a tier 2 methodology is only possible if specific country-specific parameters and other key inputs are available, which were not available at the moment and would take significant time to develop. The Party also explained that using a tier 2 methodology to estimate CH_4 emissions for swine was planned for the 2019 submission. The ERT recommends that Slovakia estimate CH_4 emissions from manure management for swine using a tier 2 methodology, including a country-specific EF in accordance with the 2006 IPCC Guidelines, and, until this recommendation can be implemented, give details in its NIR of the national circumstances that explain why it was unable to implement this recommendation.	Yes. Accuracy
A.9	3.D.a.2.b Sewage sludge applied to soils – N_2O	Slovakia reported direct N_2O emissions from sewage sludge applied to soils for 1990–2009 as "NE", estimates for 2010–2014 (0.00048 kt N_2O, 0.00019 kt N_2O, 0.00065 kt N_2O, 0.00027 kt N_2O and 0.0000042 kt N_2O, respectively) and "NO" for 2015, but no explanation was provided in the NIR. During the review Slovakia explained that AD were not available for 1990–2009 and that sewage sludge was not applied to agricultural soils in 2015 (a confirmation statement was provided by the Water Research Institute). However, the ERT noted that NIR table 7.22 (p.365) reports that 9,819 t sludge was applied to soils in 2015. The Party explained that NIR table 7.22 is incorrect and reconfirmed that there was no sewage applied to soils in 2015. The ERT recommends that Slovakia estimate and report N_2O emissions for 1990–2009 (the ERT noted that the 2006 IPCC Guidelines provide several techniques for completing the time series of AD). The ERT also recommends that the Party explain that the AD and N_2O emissions for 2015 were reported as "NO" because no sewage sludge was applied to soils in that year. The ERT further recommends that the Party report consistently information on the amount of sewage sludge applied to soils for the agriculture and waste sectors, correcting the information for the waste sector in the NIR that there was 9,819 t sludge applied to soils in 2015.	Yes. Completeness

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
A.10	3.D.a.2.c Other organic fertilizers applied to soils – N_2O	AD and N_2O emissions for other organic fertilizers applied to soils were reported as "NE" in CRF table 3.D, but no information was provided in the NIR or CRF table documentation box. During the review Slovakia explained that data on the amount of compost applied to soils were not available and that the Central Control and Testing Institute in Agriculture is undertaking additional research on composting. In addition, the Party explained that the issue is included in the improvement plan for the next annual submission. The ERT believes that this issue should be considered further in future reviews to confirm that there is no underestimation of emissions. The ERT recommends that Slovakia estimate and report N_2O emissions from other organic fertilizers applied to soils.	Yes. Completeness
A.11	3.D.a.3 Crop residues – N_2O	In the NIR the information provided by Slovakia regarding N_2O emission from crop residues applied to soils is inconsistent between tables. For example, in NIR table 5.47 Slovakia reported the total area of cropland for 2015 as 1,127,918 ha. However, the sum of the total area of crops (1,127,918 ha) (NIR table 5.48) and the total area of N-fixing crops (93,184 ha) (NIR table 5.50) is 1,221,102 ha for 2015. In addition, NIR table 5.50 reports that the total area of N-fixing crops and total N fixed for 2015 are 93,184 ha and 24,495 kg. However, in NIR table 5.51 the Party reported 92,309 ha and 24,494 903 kg, respectively. Furthermore, in NIR table 5.51 Slovakia reported the N_2O emissions from N-fixing crops for 2015 as 1,451 Gg, but NIR table 5.47 reports the same amount for N_2O emissions from all crop residues applied to soils. During the review Slovakia explained that the total area of agricultural land in 2015 was 3,744,100 ha, but this represents the agricultural land available (arable in the NIR) and not the land used for crop cultivation. Part of the available agricultural land is mostly used for grazing animals or not cultivated. The cropland area (wheat, rye, barley, oat, maize, potato, sugar beet, oil plants, tobacco, fodder potato and maize for silage) is 1,127,918 ha and the N-fixing crops area (peas, lentils, beans, mix of fodder, soybeans, alfalfa, clover and other fodder crops) is 93,184 ha. Using the country-specific methodological approach used for this category, the Party estimated these areas separately. The Party explained that the amount of N fixed reported in the last column in NIR table 5.50 is in t (not in kg) and that the N_2O emissions from total crop residues reported in the last column in NIR table 5.51 are only from N-fixing crops. Slovakia also explained that the total N_2O emissions from crop residues and N-fixing crops are 1.451 Gg (0.3849 Gg from N-fixing crops and 1.0661 Gg from other crops) and the total area calculated to estimate N_2O emissions from crop residues is 1,221,102 ha (the sum of the area of cropland and the area of N-fixing crops). Slovakia indicated that it plans to improve the reporting in NIR chapters 5.11.8 and 5.11.9 in the next annual submission. The ERT recommends that Slovakia clearly report, and explain in the NIR the differences between, total agriculture land, land for crop cultivation and land for N-fixing crops. The ERT also recommends that the Party correct the values reported for N_2O emissions in the NIR by indicating that the values in NIR table 5.50 are in t (not in kg) and that N_2O emissions from total crop residues reported in the last column in NIR table 5.51 are only from N-fixing crops.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[20] If yes, classify by type
A.12	3.D.a.6 Cultivation of organic soils (i.e. histosols) – N_2O	In the NIR (p.281) Slovakia explained that direct N_2O emissions from cultivation of organic soils were reported as "NE" because the emissions are below the threshold of significance, although numerical justification in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines was not provided in the NIR. However, in CRF table 3.D they were reported as "NO". During the review Slovakia explained that "NO" in CRF table 3.D is incorrect but it resulted from an error during upload of the data to the CRF Reporter software. The ERT recommends that Slovakia estimate and report N_2O emissions from cultivation of organic soils, or, if the Party considers them insignificant, report them as "NE" and justify that the likely level of emissions is below the threshold indicated in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Yes. Completeness
LULUCF			
L.10	4. General (LULUCF) – CO_2	The previous ERT recommended that the Party conduct a tier 1 uncertainty analysis at the land-use subcategory level (see ID# L.3 in table 3). The 2017 NIR (chapters 6.5.5, 6.6.3, 6.7.3, 6.9.3 and 6.10.3) presents a complete analysis of uncertainty. However, the ERT noted that the total uncertainty values for land-use categories are high, for example the uncertainty for forest land is 77 per cent, for cropland 100 per cent and for grassland and settlements 151 per cent. Slovakia explained in the NIR (chapter 6) that the uncertainty of certain variables, such as the uncertainty of the land-use matrix, was selected from the default values in the 2006 IPCC Guidelines or IPCC good practice guidance for LULUCF. The previous review report indicated that the Party's improvement plan considered the implementation of a tier 2 uncertainty assessment for the LULUCF sector using the Monte Carlo method for the 2018 submission. The ERT recommends that the Party, when using default uncertainty values for parameters, use default values from the 2006 IPCC Guidelines and not from the IPCC good practice guidance for LULUCF, and reference the source of those values. The ERT encourages the Party to explore the possibility of improving the uncertainty estimation by developing country-specific uncertainty values from national AD, such as uncertainty of land use from the Geodesy, Cartography and Cadastre Authority of the Slovak Republic. Noting the Party's plans to implement a tier 2 uncertainty assessment, the ERT also encourages Slovakia to perform a sensitivity analysis to determine which of the input uncertainties of the LULUCF sector contributes most substantially to the overall uncertainty.	Yes. Accuracy
L.11	4.A.1 Forest land remaining forest land – CO_2	In the NIR (chapter 6.5.1) Slovakia reported in detail the different EFs (e.g. BCEF and root-to-shoot ratio) used for estimating carbon gain and losses and stock changes in living biomass for forest land and forest land converted to other land uses. The ERT noted that the use of only one root-to-shoot ratio (0.2) is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 4, table 4.4) because different species present different values, and 0.2 is attributable only to conifers with above-ground biomass over 150 t/ha. Moreover, the ERT noted that the carbon fraction of dm used in NIR table 6.6 is not exactly the same as that in the 2006 IPCC Guidelines (volume 4, chapter 4, table 4.3) because the values used (0.5 for spruce, fir, pine, larch and other conifer and 0.49 for the rest of the species) are not the default value (0.5) or the default value for broadleaves (0.48) or conifers (0.51), although they are within the ranges provided in the guidelines.	Yes. Accuracy

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[b] If yes, classify by type*
		During the review Slovakia explained that the issue of the consistency of the values (BCEF) was raised and accepted by the previous ERT (see ID# L.2 in document FCCC/ARR/2016/SVK: "The derivation of time-series weighted mean BCEF values for each species based on age-class structure and species composition is included in the 2016 NIR (section 6.7.2)"). The Party also explained that the reason for selecting one value for the root-to-shoot ratio (0.20) was to keep a conservative approach and not overestimate CO_2 removals. The ERT recommends that the Party apply different root-to-shoot ratios for different species and according to above-ground biomass (t dm/ha) instead of using only one value for all species. The ERT also recommends that the Party, if using default values from the 2006 IPCC Guidelines, use the middle of the range values for the carbon fraction of above-ground forest biomass (all, broadleaves and conifers) (volume 4, chapter 4, table 4.3), or justify why it used values from the range but not the middle thereof.	
L.12	4.B.1 Cropland remaining cropland – CO_2	The ERT noted that there are organic soils in cropland (2.3 kha in 2015), but the Party reported the area and emissions as "NO" (the Party reported the area and emissions under mineral soils) (see ID# L.8 in table 3). The ERT recommends that the Party report the area and associated stock changes of carbon in organic soils for cropland in CRF table 4.B, replacing the "NO" currently reported.	Yes. Completeness
L.13	4(V) Biomass burning – CO_2, CH_4 and CO	The Party reported in the NIR (p.300) that emissions from wildfires in forest land were estimated using IPCC default values for the available mass of fuel for combustion (19.8 t dm/ha) and the combustion factor (1). The ERT recommends that the Party not include the mass available for combustion and the combustion factor as separate parameters (19.8 t dm/ha and a combustion factor of 1, as reported in the NIR) to use in equation 2.27 (2006 IPCC Guidelines, volume 4, chapter 2, table 2.4) but include the value of their product (obtained from the 2006 IPCC Guidelines, volume 4, chapter 2, table 2.4).	Yes. Transparency
L.14	4(V) Biomass burning – CO_2, CH_4 and CO	The Party reported that wildfires in forest land remaining forest land occurred on 346.65 ha in 2015 (NIR p.300; CRF table 4(V)) and that the available mass of fuel for combustion (19.8 t dm/ha) and other EFs were obtained from the 2006 IPCC Guidelines (volume 4, chapter 2, tables 2.4 and 2.5, respectively). The ERT noted that the available mass of fuel is in accordance with the 2006 IPCC Guidelines but different from the average value of biomass for Slovakian forest (283 m^3/ha according to the *National Forest Inventory and Monitoring of the Slovak Republic 2005–2006* (available at http://www.forim.sk/index_soubory/Smelko_Seben_Bosela_Merganic_Jankovic_2008_en.pdf). During the review Slovakia explained that the average biomass stocks per ha for eight different Slovak regions are 132–183 t dm/ha (mean 153) for coniferous and 153–194 t dm/ha (mean 178) for broadleaves. The Party also explained that in forest fires it is not common for stands with high stocking volumes to burn or for the whole amount of the biomass on the reported area of forest fire to burn completely. The Party further explained that NFI data may have limited applicability because fire areas are usually small and assumed to occur on the border of forest land with other land-use areas, and it is unlikely that those areas have the	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
		average biomass stock of forest. Therefore, the NFI data are not representative of these particular fire areas, and use of NFI data might increase the uncertainty of the estimates. The ERT recommends that the Party explain its use of the default IPCC value for the available mass of fuel for combustion (19.8 t dm/ha) in forest land remaining forest land to estimate emissions from forest wildfires instead of using the available country-specific regional data available.	
L.15	4(V) Biomass burning (forest land remaining forest land) – CO_2	NIR table 6.8 reported 10.77 kt CO_2 and 14.55 kt CO_2 emissions for 2015 from forest land remaining forest land for wildfires and controlled burning, respectively. CRF table 4(V) reported the same amount of CO_2 emissions as the NIR for wildfires but reported "IE" for CO_2 emissions from controlled burning. During the review the Party explained that the emissions from controlled burning reported in the NIR are for reference only and that those emissions were reported as losses from the biomass pool in the CRF tables. The ERT recommends that the Party report CO_2 emissions from controlled burning in forest land remaining forest land consistently in NIR table 6.8 and in CRF table 4(V).	Yes. Transparency
Waste			
W.4	5.A Solid waste disposal on land – CH_4	In the NIR (chapter 7.5) Slovakia explained the changes to the waste legislation that occurred in the country during the time series. The ERT noted that the new legislation in 2015 affected the production and recycling of waste. However, the ERT considers that the description of the mass flows for the different waste types from generation to the different treatment options, including recycling and landfilling, is not completely clear. The ERT recommends that Slovakia improve the description in the NIR of the mass flows for the different waste types, from generation to the different treatment options, including recycling and landfilling.	Yes. Transparency
W.5	5.A.1 Managed waste disposal sites – CH_4	In both the 2016 and 2017 annual submissions Slovakia reported CH_4 emissions from managed solid waste disposal sites for 1995 onward (MSW and non-municipal solid waste). The Party reported in NIR table 7.11 the differences between the emission estimates for non-municipal solid waste in managed landfills in the current and the previous annual submission. The ERT noted that the recalculations decreased the emission estimates significantly (by 25–32 per cent per year between 1995 and 2014), but the ERT considers that the NIR does not explain the recalculations in appropriate detail (e.g. the NIR indicates that some parameters were corrected but does not indicate which were the previous and which the corrected values). The ERT believes that this issue should be considered further in future reviews to confirm that the methods used in the recalculations have not led to an underestimation of emissions. The ERT recommends that the Party explain in detail the methodology used to estimate emissions from non-municipal solid waste in managed waste disposal sites, in particular for the period 1995–2014.	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[b] If yes, classify by type
W.6	5.A.1.a Anaerobic (managed waste disposal sites) – CH_4	The Party reported AD for 1990–1994 for category 5.A.1.a anaerobic managed disposal sites in CRF table 5.A (e.g. the Party reported 79.83 kt of waste for 1994) but the Party reported the associated CH_4 emissions as "NO". The ERT believes that this issue should be considered further in future reviews to confirm that there is no underestimation of emissions. The ERT recommends that Slovakia estimate and report CH_4 emissions from anaerobic managed waste disposal sites for 1990–1994 and explain any recalculations in the NIR.	Yes. Completeness
W.7	5.D.2 Industrial wastewater – N_2O	For direct N_2O emissions, the NIR (chapter 7.4, p.346) indicates that the estimation of N_2O emissions from discharged industrial wastewater requires further research, validation of AD and evaluation of the databases on wastewater of the Slovak Hydrometeorological Institute to assess the possibility of estimating direct emissions from industrial wastewater. During the review the Party explained that the recalculated emissions will be available for the 2019 annual submission. The ERT recommends that the Party report on the progress of the planned improvements reported in the NIR (chapter 7.4), including what type of data validation and evaluation of databases is planned.	Yes. Transparency
KP-LULUCF			
KL.4	General (KP-LULUCF) – CO_2	The Party reported methods for estimating CSC and emissions and removals (NIR chapter 11.3.1) for KP-LULUCF activities. The Party used the same methods and EFs to estimate CSC in living biomass for AR, deforestation and FM (the three KP-LULUCF activities) as for forest land remaining forest land and land converted to forest land (LULUCF reporting under the Convention). The ERT commends the Party for maintaining consistency in the methods used for estimating CSC and emissions and removals for its reporting on KP-LULUCF and under the Convention.	Not a problem
KL.5	General (KP-LULUCF) – CO_2	The ERT noted that the EFs used to estimate gains and losses for the above-ground biomass carbon pool for AR (spruce 2.74 t dm/ha/year, pine 3.17 t dm/ha/year, beech 2.32 t dm/ha/year and oak 1.23 t dm/ha/year, as indicated in the NFI; attributable to young forest) were lower than the EFs used for FM (inferred from tables 6.5 and 6.6 of the NIR; attributable to older forest). The EFs for AR were derived from the current annual increment for spruce, pine, oak and beech and the share of each species in the afforested and reforested area. The annual increment of the above-ground and below-ground tree biomass under KP-LULUCF for the four main tree species (Norway spruce, Scotch pine, European beech and Sessile oak) in young forest plantations was selected from the experimental database of the National Forest Centre. During the review the Party explained that the Institute for Forest Resources and Information does not have values of biomass increments for the first age classes. The EFs for newly established areas were obtained from the experimental database of the National Forest Centre Institute for Forest Resources and Information and resulted in lower values than for already established forests. The Party also explained that the average biomass stocks per ha for eight different Slovak regions are 132–183 t dm/ha (mean 153) for coniferous and 153–194 t dm/ha (mean 178) for broadleaves. The Party further explained that the NIRs and yield tables of neighbouring countries (e.g. Austria, Czechia, Hungary and Germany, as well as the United Kingdom of Great Britain and Northern Ireland) seem to indicate that biomass current annual increment or mean annual increment of	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		above-ground biomass reaches maximum growth after 30–50 years since the beginning of afforestation. For this reason, Slovakia considers using its national current annual increment values (lower than the EFs for FM) for AR areas to be appropriate. The ERT recommends that the Party justify the EFs used to estimate gains and losses for the above-ground biomass carbon pool for AR being lower than the EFs used for FM, by, for example, explaining the Party's analysis of the NIRs or comparison of the yield tables of other Parties.	
KL.6	General (KP-LULUCF)	The Party reported information on the areas for KP-LULUCF activities (e.g. spatial assessment units for determining the area of the units of land under KP-LULUCF activities in NIR chapter 11.2.1 and the methodology used to develop the land-transition matrix in NIR chapter 11.2.2). The Party reported that the Slovak system has the attributes of both approach 2 and approach 3 of the 2006 IPCC Guidelines (volume 4, chapter 3.3.1) when representing land areas. The ERT noted a lack of similarity with the land-use information provided in NIR chapter 6 (LULUCF). However, during the review the Party explained that Slovakia is not using a different source of information for reporting KP-LULUCF activities than for the reporting under the Convention (LULUCF sector). The Party considers that the land-use change identification system is capable of obtaining reliable and accurate land-use maps for LULUCF as well as for the KP-LULUCF reporting. The Party is also using all available data sources that may increase the accuracy of the reporting (e.g. the national programme on afforestation of the land unsuitable for agricultural production, satellite images, orthophotomaps). The ERT recommends that the Party enhance the information reported in the NIR related to obtaining land-use maps and land-transition maps for KP-LULUCF and LULUCF and demonstrate how the two systems are consistent.	Yes. Transparency
KL.7	General (KP-LULUCF)	The Party did not report information to indicate whether anthropogenic emissions by sources and removals by sinks from LULUCF activities under Article 3, paragraph 3, and FM under Article 3, paragraph 4, of the Kyoto Protocol factor out removals from elevated CO_2 concentration above pre-industrial levels, indirect N deposition or the dynamic effects of age structure resulting from activities prior to 1 January 1990. The ERT noted that this is not in accordance with decision 2/CMP.8, annex II, paragraph 3, which indicates that Parties should provide such information. The ERT encourages the Party to report information on factoring out removals as requested in decision 2/CMP.8, annex II, paragraph 3(a–c).	Not a problem
KL.8	Deforestation – CO_2	The Party used default coefficients for the root-to-shoot ratio for coniferous (0.20) and broadleaves (0.24) from the 2006 IPCC Guidelines (volume 4, table 4.4; more than 150 t dm/ha) for calculating the below-ground biomass stocks before conversion (NIR p.393). The ERT noted that the Party has country-specific information on different ratios for different forest classes. During the review the Party explained that the average biomass stocks per ha for eight different Slovak regions is from 132 to 183 t dm/ha (mean 153) for coniferous and from 153 to 194 t dm/ha (mean 178) for broadleaves and that it used the default two values from the IPCC guidelines to avoid overestimating CO_2 removals. The cadastral data source demonstrate deforested areas for individual regions.	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a]? If yes, classify by type
		The ERT recommends that the Party demonstrate that deforestation occurs only in forests with more than 150 t dm/ha to demonstrate that the root-to-shoot ratio for coniferous (0.20) and broadleaves (0.24) used in the estimates of below-ground biomass stocks before conversion are in accordance with the 2006 IPCC Guidelines or use country-specific ratios.	
KL.9	FM – CO_2	The ERT noted that the accounting quantities that the Party reported in the CRF accounting table for net emissions and removals from FM are significantly higher than the FMRL: the reported net removals from FM are 6,789.44 kt CO_2 eq, 4 845.26 kt CO_2 eq and 5 158.64 kt CO_2 eq for 2013, 2014 and 2015, respectively, but the net removals for the FMRL are reported as 1,084.00 kt CO_2 eq. The ERT also noted that Slovakia's FMRL is based on a projection (NIR chapter 11.5.2.2) and that the Party chose to account for KP-LULUCF activities at the end of the commitment period. The ERT also noted ID# KL.1 (table 3) raised in the previous review report.	Yes. Accuracy
		The ERT recommends that the Party explain the main factors responsible for the reporting of a greater sink during the commitment period compared with the FMRL, with the aim of showing that the accounting quantity can be explained by deviations in policy assumptions compared with those included in the FMRL, rather than differences in the factors/parameters, including increments, used in the FMRL and in the actual estimates of emissions and removals, as requested in the *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*.	
KL.10	FM – CO_2, CH_4 and N_2O	The Party reported its FM cap as 20,843.88 kt CO_2 eq in the CRF accounting table. However, the ERT noted that the report on the review of the report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol of Slovakia (FCCC/IRR/2016/SVK, page 11) set this value as 20,796.023 kt CO_2 eq.	Yes. Accuracy
		The ERT recommends that the Party report the correct FM cap (20,796.023 kt CO_2 eq) in the CRF accounting table.	
KL.11	Biomass burning – CH_4 and N_2O	The ERT noted ID# L.14 above on the available mass of fuel for combustion and that the Party estimated CH_4 and N_2O emissions from wildfires for AR and for FM.	Yes. Transparency
		The ERT recommends that the Party explain its use of the default IPCC value for the available mass of fuel for combustion (19.8 t dm/ha) in AR and FM to estimate emissions from forest wildfires instead of using the available country-specific regional data.	

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

10. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of Slovakia.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. Slovakia has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2017 review.

VIII. Questions of implementation

12. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Slovakia for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Slovakia

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by Slovakia.

Table 6
Total greenhouse gas emissions for Slovakia, base year[a]–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–1 084.00
Base year	65 469.09	74 460.34	NA	NA	NA		NA	
1990	65 469.09	74 460.34	NA	NA				
1995	45 127.47	54 411.60	NA	NA				
2000	40 144.17	49 863.07	NA	NA				
2010	40 547.07	46 559.69	NA	NA				
2011	39 046.50	45 455.58	NA	NA				
2012	35 629.74	43 251.41	NA	NA				
2013	34 814.36	42 885.65	NA	NA		–400.03	NA	–6 789.44
2014	34 556.04	40 677.79	NA	NA		–379.01	NA	–4 845.26
2015	34 840.70	41 269.49	NA	NA		–400.66	NA	–5 158.64

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF_3, for which the base year is 2000. Slovakia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has not reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

Table 7

Greenhouse gas emissions by gas for Slovakia, excluding land use, land-use change and forestry, 1990–2015

(kt CO_2 eq)

	CO_2[a]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	61 935.05	7 198.63	5 011.74	NO	314.86	NO	0.06	NO
1995	44 779.18	6 010.81	3 465.49	13.32	132.65	NO	10.15	NO
2000	41 265.80	5 355.32	3 108.95	105.04	14.91	NO	13.04	NO
2010	38 536.13	4 531.00	2 850.69	597.24	25.01	NO	19.62	NO
2011	37 811.21	4 603.57	2 394.87	605.03	20.11	NO	20.80	NO
2012	36 001.10	4 224.88	2 350.33	628.20	25.66	NO	21.24	NO
2013	35 543.38	4 367.75	2 295.53	646.88	9.81	NO	22.30	NO
2014	33 442.47	4 215.96	2 340.21	653.84	11.15	NO	14.17	NO
2015	33 816.79	4 352.44	2 342.56	734.88	8.50	NO	14.31	NO
Per cent change 1990–2015	**–45.4**	**–39.5**	**–53.3**	**NA**	**–97.3**	**NA**	**24 423.5**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Slovakia did not report indirect CO_2 emissions in CRF table 6.

Table 8

Greenhouse gas emissions by sector for Slovakia, 1990–2015

(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	56 667.66	9 813.05	6 587.01	–8 991.25	1 392.62	NO
1995	39 567.82	9 383.33	4 121.87	–9 284.13	1 338.58	NO
2000	36 539.52	8 594.17	3 378.74	–9 718.90	1 350.64	NO
2010	32 741.10	9 609.94	2 813.38	–6 012.61	1 395.27	NO
2011	32 022.32	9 200.01	2 806.24	–6 409.08	1 427.02	NO
2012	29 779.31	9 123.09	2 890.52	–7 621.67	1 458.49	NO
2013	29 621.67	8 846.91	2 970.82	–8 071.29	1 446.26	NO
2014	27 089.27	9 064.43	3 047.13	–6 121.76	1 476.96	NO
2015	27 445.21	9 285.16	3 014.46	–6 428.80	1 524.67	NO
Per cent change 1990–2015	**–51.6**	**–5.4**	**–54.2**	**–28.5**	**9.5**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Slovakia did not report indirect CO_2 emissions in CRF table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for Slovakia

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–1 084.00				
Technical correction				NA				
Base year	NA				NA	NA	NA	NA
2013		–443.07	43.04	–6 789.44	NA	NA	NA	NA
2014		–441.81	62.80	–4 845.26	NA	NA	NA	NA
2015		–465.10	64.45	–5 158.64	NA	NA	NA	NA
Per cent change base year–2015					**NA**	**NA**	**NA**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] Slovakia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for Slovakia's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Slovakia under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) FM: commitment period accounting
	(d) CM: not elected
	(e) GM: not elected
	(f) RV: not elected
	(g) WDR: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	No
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	2 599.503 kt CO_2 eq (20 796.023 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Information to be included in the compilation and accounting database

Tables 11–13 include the information to be included in the compilation and accounting database for Slovakia. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable) as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for Slovakia
($t\ CO_2\ eq$)

	Original submission	*Revised estimate*	*Adjustment*	*Final*
CPR	182 042 046			182 042 046
Annex A emissions for 2015				
CO_2	33 816 790			33 816 790
CH_4	4 352 444			4 352 444
N_2O	2 342 559			2 342 559
HFCs	734 885			734 885
PFCs	8 504			8 504
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	14 314			14 314
NF_3	NO			NO
Total Annex A sources	**41 269 495**			**41 269 495**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	–465 103			–465 103
3.3 Deforestation	64 445			64 445
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	–5 158 639			–5 158 639

Table 12
Information to be included in the compilation and accounting database for 2014 for Slovakia
(t CO_2 eq)

	Original submission	*Revised estimate*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2	33 442 467			33 442 467
CH_4	4 215 962			4 215 962
N_2O	2 340 207			2 340 207
HFCs	653 839			653 839
PFCs	11 148			11 148
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	14 168			14 168
NF_3	NO			NO
Total Annex A sources	**40 677 792**			**40 677 792**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–441 808			–441 808
3.3 Deforestation	62 799			62 799
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–4 845 264			–4 845 264

Table 13
Information to be included in the compilation and accounting database for 2013 for Slovakia
(t CO_2 eq)

	Original submission	*Revised estimate*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2	35 543 379			35 543 379
CH_4	4 367 746			4 367 746
N_2O	2 295 534			2 295 534
HFCs	646 878			646 878
PFCs	9 810			9 810
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	22 303			22 303
NF_3	NO			NO
Total Annex A sources	**42 885 651**			**42 885 651**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–443 068			–443 068
3.3 Deforestation	43 036			43 036
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–6 789 438			–6 789 438

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) N_2O emissions from sewage sludge applied to soils (1990–2009) under category 3.D.a.2.b sewage sludge applied to soils (see ID# A.9 in table 5);

(b) N_2O emissions from other organic fertilizers under category 3.D.a.2.c other organic fertilizers applied to soils (see ID# A.10 in table 5);

(c) N_2O emissions from category 3.D.a.6 cultivation of organic soils (i.e. histosols) (see ID# A.12 in table 5);

(d) CSC in organic soils from category 4.B.1 cropland remaining cropland (see ID# L.12 in table 5);

(e) CH_4 emissions from category 5.A.1.a anaerobic managed waste disposal sites for 1990–1994 (see ID# W.6 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies.
Available at http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl/.

IPCC. 2014a. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies.
Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

IPCC. 2014b. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC.
Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual reviews of the 2013, 2014, 2015 and 2016 annual submissions of Slovakia, contained in documents FCCC/ARR/2013/SVK, FCCC/ARR/2014/SVK, FCCC/ARR/2015/SVK and FCCC/ARR/2016/SVK, respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for Slovakia for 2017. Available at http://unfccc.int/resource/docs/2017/asr/svk.pdf.

Bodík I and Kubaská M. 2013. Municipal sewage sludge management in the Slovak Republic – actual status and perspectives. *Residuals Science & Technology*. 10(4).

European Environment Agency. 2016. *EMEP/EEA air pollutant emission inventory guidebook 2016*.
Available at https://www.eea.europa.eu/publications/emep-eea-guidebook-2016.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Jana Kianička (Emission Trading Department, Directorate for Climate Change and Air Protection, Ministry of Environment) and Ms. Janka Szemesová and Ms. Lenka Zetochová (Slovak Hydrometeorological Institute), including additional material on the methodologies and assumptions used.